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THE

PSYCHOLOGICAL BULLETIN

PROCEEDINGS OF THE MEETING OF THE WESTERN PSYCHOLOGICAL ASSOCIATION, STANFORD UNIVERSITY, JUNE 20 AND 21, 1929

Report of the Secretary, PAUL R. FARNSWORTH, *Stanford University*

The ninth annual meeting of the Western Psychological Association was held at the University of California at Berkeley, June 20 and 21, 1929, in conjunction with the meetings of the Pacific Division of the American Association for the Advancement of Science. Approximately one hundred persons were in attendance.

There were four sessions of papers and an annual dinner. Following the latter, the retiring President, Dr. Warner Brown, read an address on "Intelligence."

The officers elected for the ensuing year were: John E. Coover, President; Stevenson Smith, Vice-President; Paul R. Farnsworth, Secretary-Treasurer.

It was decided to accept the invitation of the University of Southern California, to hold the 1930 meeting there probably in the latter part of June.

ABSTRACTS OF PAPERS

The Reading of Music. HOMER E. WEAVER, Stanford University. (Introduced by Walter R. Miles.)

Experimental studies of the reading of music have just been started within the last few years. Students of music learn to read largely by trial and error. Some stumble onto good methods while others are less fortunate. The many millions of dollars spent on music education each year would alone justify a careful study of the

reading of music but such a study would also be of great value from a psychological point of view. Musical material is ideal for tachistoscopic studies of visual apprehension. A study of the peripheral cues involved in reading music should furnish new data on this important aspect of the reading process. Data on the eye-hand span in music reading will be of value in a better understanding of the relations between two such complex motor skills as the visual and manual processes involved. It is now possible to study objectively many aspects of this very complex human behavior process. If we assume that a musical composition, which lies within the technical ability of the reader, will be played as it is understood, we are not handicapped, as in studies of other types of reading, by the great difficulty of getting a measure of the comprehension of the material read. Records of the playing being available it is unnecessary to use introspections or verbal reports. Considering the fact that any musical composition is written to be played at a definite tempo, it is obvious that the significant differences to be found between individuals will lie in the organization of eye movements rather than in the number and duration of fixations. A study of learning in connection with the reading of music should furnish valuable data to the general field of studies of learning. We have at Stanford University apparatus by which we can get a continuous photographic record of movements of the eye made in any direction and a simultaneous record of what is being played by the hands with time on both from a single timing device.

New Instrumental Methods in Child Study. HAROLD ELLIS JONES, Institute of Child Welfare, University of California.

Diary records, questionnaires, ratings, tests and clinical studies provide the major part of our present data on child development. Instrumental methods have been slow to develop, partly because of technical difficulties in instrumentation with young children, and partly because of a tendency to restrict problems in this field to a simple naturalistic level. As a step toward placing certain of these problems on a laboratory basis, the following apparatus assemblies have been made: (1) A new tachistoscope, exposing pictures, objects and groups of objects by moving them at variable rates horizontally across a variable aperture. The threshold exposure time for recognition can be measured. (2) A reaction time equipment for measuring (with a Dunlap chronoscope) the latent time of unconditioned

and conditioned reflexes, simple and discriminatory reaction time, and the speed of left vs. right eye-hand coördinations. (3) An exposure wheel, controlled by the child, which presents in a lighted opening a succession of stimulus objects; an electrically controlled stop-watch measures the period of observation for each object. (Taken as an index of interest.) (4) An activity recorder, consisting of a calibrated strip chart with ten ink pens, for the study of handedness, activity patterns, and the gross activity of infants and of older children during sleep. (5) A multiple choice box, operated by buttons which open a reward compartment when the correct symbols are responded to. The influence of punishment can also be studied, through the use of inductorium connections in the buttons. (6) A galvanometric equipment, with a wheatstone bridge and a supplementary rheostat for rapid balancing, adapted for use with young children. Preliminary results with these and other instruments indicate their value (a) in supplying precise measurements which can be utilized in connection with other cumulative studies; (b) in eliminating the personal factor of the experimenter; (c) in maintaining the interest and coöperation of young children in laboratory situations.

A Study of Orientation in a Maze. JOSEPH G. YOSHIOKA, Institute for Juvenile Research, Chicago.

To ascertain whether or not the rat has a directional sense and hence is influenced in the choice of paths in a maze by the direction of the goal, twenty-eight white rats were made to run a straight path which expands in the middle into a diamond formed of an inner and outer square. The diamond offers two detour paths, right and left, of equal length. The maze was placed on the east-west line. The food-box and the start were interchanged at each trial so that the rats running east on the first trial headed west on the second trial. In the training series the rats were forced through the two paths alternately six times (three in each path) daily for eight days. In the test series six daily choices were given for ten days. In this situation the rats chose one path as often as the other. Next the food-box was shifted toward north by the steps of 22°½ with respect to the east-west line until it was due north. It was found that the mean choice of the north path in sixty choices was 32.29, 32.68, 31.64, 31.36 and 31.04, when the food-box was at 0°, 22°½, 45°, 67°½, and 90° north, respectively, with reference to the east-west line. The critical ratios obtained from these means and the score by

chance, which is 30 ± 3.87, varied from .25 to .68. In each situation one path was not taken any more than the other. Continuing further, the inner square of the diamond in the last situation, where the food-box was at 90° north, was taken out, thus leaving there a diamond space. In this situation the rats followed along the north wall 36.07 times out of 60 choices, the critical ratio rising to 2.06. When the food box was brought back to 0° the choice of the north path fell down to 26.50, the critical ratio coming down to 1.04. From the evidence presented above it is concluded that the rat shows no sense of direction in an ordinary maze situation, but in an open space it orients itself toward the direct route to the goal.

A Study of Mental Growth Pattern in Relation to Rate of Development. ELLEN ALICE MCANULTY, Los Angeles City Schools.

An analysis has been made of the results of individual Binet tests given by trained examiners. All cases in the study (about 400) are of the same mental age level, between eight years and six months and nine years and six months. The intelligence quotients range from 50 to 144. Children of slow rate of mental development are contrasted, test by test, with children of rapid mental development.

A Modification of Three Music Tests. PAUL R. FARNSWORTH, Stanford University.

Of the "music" tests appearing on phonograph records, at least three have reliabilities so low as to make them practically valueless. These are the Seashore "Sense of Consonance," the Kwalwasser "Melodic Sensitivity," and the Kwalwasser "Harmonic Sensitivity" tests. In the present experiment all three were treated as preference tests (the two latter already were of this type, and the consonance test is frequently given as a preference test). The subjects' responses were taken as criteria for correctness when the ballots showed sufficient consistency. This method did not improve the odd-even reliability of the consonance test. This value, which had been $.36 \pm .04$, was changed to $.30 \pm .05$. The other tests had their reliabilities somewhat enhanced. That of harmony, which had been $.17 \pm .05$, became $.61 \pm .04$. The value for melody changed from $.26 \pm .05$ to $.47 \pm .05$. Other students were subjected to the Kwalwasser tests to ascertain the stability of this method of procedure. Harmony scores which showed a reliability of $.21 \pm .06$ when the Kwalwasser scoring sheet was used now gave a value of $.51 \pm .05$. Similarly, melody scores which had a reliability of

.42 ± .05 now came out .49 ± .05. It has thus proved possible to slightly raise the odd-even reliability of the Kwalwasser tests. They are still low, however, approximating those found for the Seashore "Sense of Time" test.

Relationships Between Perseveration, Introversion, and Depression. HERBERT H. JASPER, University of Oregon (introduced by E. D. Conklin).

Spearman has concluded that introversion or subjectivity in personality reactions and melancholy or depression can be resolved into differences in perseveration. Furthermore, perseveration is considered to be a general factor in addition to his "g." Sensory, motor, and ideational measures of perseveration were given to eighty college students. A questionnaire measure of degree of depression was developed and compared with Conklin's extraversion-introversion interest ratios. No relation was found between the measures of perseveration and the measure of depression or between the measures of perseveration and the measure of introversion. There was no evidence from our results for a general factor of perseveration running through the tests used. There was, however, a correlation of .43 between the measure of depression and the measure of introversion.

Analysis of Substitution-Test Performance. J. E. COOVER, Stanford University.

Descriptions written by students immediately after each of the eight two-minute work periods indicate that the form of the process of substituting symbols for digits passes through cycles of changes from the early substitutions when none of the symbols is known and is taken from the key, through an intermediate stage when the symbols are recalled from a system of imagery in which they are more or less organized with respect to discovered relationships, to the final stage in which the recording is automatic and imagery is adventitious and distracting. A promising incubated process incompatible with its predecessor depresses the score; the practice on an emerging process that serves to bring performance to higher skill causes a plateau. The new process freed from its collaborating predecessor produced a peak. In short, the scores are longitudinally heterogeneous and the practice curve is a function of the changing form of the process. Compare the current dogma of "habit" and "synapse."

Summation and Subtraction of Brightness in Binocular Perception. H. R. De Silva and S. H. Bartley, University of Kansas.

Since homonymous halves of both retinae are connected with the same half of the cerebrum it is usually assumed that corresponding points of the two retinae are represented in the visual projection areas of the cortex by single patterns. However, Helmholtz, Sherrington, Abney and Watson, Dawson, and others have claimed to have proven by experiment that there is no binocular summation of brightness. Sherrington argues that the right and left uni-ocular sensations are elaborated independently and are combined by a psychical synthesis which yields no summation or subtraction. We have by means of a new apparatus and technique varied the proportion of the light coming to one eye from 1/16 to totality, and have obtained definite subtraction and summation effects at different levels of light intensities. For example, at one level of light intensity we find that the subtractive effect varies approximately as follows: 18 per cent when the combined light intensity to both eyes is reduced 1/32; 26 per cent when it is reduced ⅛; 32 per cent when it is reduced ¼; 37 per cent when it is reduced ⅜; 43 per cent when it is reduced 7/16; 40 per cent when it is reduced 15/32; and 25 per cent when it is reduced ½.

Individuality in Heart-Rate Response to Work and to Rest. Walter Miles, Stanford University.

In the heart-rate we have a neuro-muscular response that is recognized to be easily measurable with subjects at rest. The use of body electrodes placed on the trunk below the arms in connection with the string galvanometer makes possible the recording of the heart rate during even severe muscular labor. By this method it is possible to take a continuous record which includes a preliminary resting period, intense exertion as in chinning a bar and relaxation after the work. Data are reported for fifty-seven young men under the conditions of preliminary rest reclining in a steamer chair, pull up to chin a bar located above the chair, and holding for eight seconds, followed by ten seconds of relaxation in the chair. The individual heart cycles were measured from R to R of the electrocardiogram. The entire record was divided into five sections, preliminary, first four seconds of work, second four seconds of work, first five seconds of rest, and second five seconds of rest. The average cycle length values for these periods in order are .86, .62,

.58, .59, and .68 seconds respectively. Using the first or preliminary value as 100 per cent. the others in turn are .73, .69, .69, and .80. Some subjects had such a prompt return of the heart rate towards normal that the final value was 95 per cent. while others gave 60 per cent. The data are related to height, weight, use of tobacco, and to other more psychological measurements.

The Project Method of Conducting Advanced Laboratory Classes. ROBERT HOLMES SEASHORE, University of Oregon.

The ordinary laboratory procedure of having students work on a large number of old experiments for only one or two periods each does not give the student sufficient training to go ahead on a real experimental problem. Too many important points are left out or hurriedly passed over in this way, and the procedure is not representative of experimental method. To be of scientific importance an experiment usually requires a thorough review of the literature, a formulation of apparatus and methods for a critical test of an important hypothesis, a long period of experimentation on a sufficiently large number of observers, and a critical evaluation of the results in form to be submitted for publication. During the past year six students in the advanced laboratory course have devoted their entire course time to carrying out individual or joint experiments which should be completed and written up for publication. All students were given the opportunity to suggest their own fields of interest and were then informed as to the facilities which the laboratory possessed or could secure along those lines. The field was then narrowed down to those experiments which could be made objective in type and critical to some important hypothesis. It was found possible to devise experiments within the student's range of interests which were yet related to the other projects. In this case most of the experiments are in the field of motor learning, and the various studies check and supplement each other. From one-tenth to one-fifth of the course was devoted to reviewing the literature, setting up apparatus for work, and standardizing and practicing the experimental procedures. Actual experimentation has taken up the rest of the course time, since the work on individual differences requires a large number of observers, who are drawn from the experimenters themselves and to a greater extent from the elementary classes in the laboratory, in which case this work is substituted for the ordinary type of laboratory demonstration. A further use of the project method has been the opportunity to use the obtained data for indi-

vidual work in a project course in statistics which is given by another member of the department during the spring quarter. The experiments this year should justify collection into a series of minor studies for one of the regular psychological journals, and a number of the students are already definitely decided on related projects for the coming year.

Visual Cues in Maze Running by the White Rat. ALBERT WALTON, University of Washington (introduced by R. H. Gundlach).

A review of the past experimentation involving the factors of visual and kinesthetic cues in maze running by white rats raises doubt as to the validity of the findings, most of which minimize the visual factor and favor that of muscular and organic control. A maze was constructed so as to prohibit the use of any but visual cues in its learning and subsequent running; a sectional maze so arranged that reversals of parts either eliminated olfactory, tactual, and kinesthetic cues or made them into false guides leading into blind alleys. Definite and consistent learning was shown by all of the ten rats employed in the test. Depending on visual cues alone, they attained to a speed and accuracy of performance comparable to those reached in standard kinesthetic types of mazes.

The Behavior of Different Nationalities in the United States. G. M. STRATTON, University of California.

It is possible to assemble evidence in regard not only to the intelligence but also to the more overt conduct of several different nationalities in our country. From the evidence of our government's publications and other sources, persons of certain nationalities seem to show in their conduct characteristic differences from the conduct of other nationalities. It is possible, indeed, to assign ranks to several of these nationalities. And the comparison of the ranks assigned by different criteria—intelligence, obedience to law, and general social adequacy—appears to reveal some important correspondence.

Sex Differences in Certain Emotional Attitudes. CATHARINE COX MILES, Stanford University.

This report is a brief preliminary statement with reference to a part of a study of sex differences being carried on at Stanford University by Professor Lewis M. Terman and the writer on a grant from the National Research Council. The part of the study in

question deals with the responses of the sexes to certain emotional situations: anger, fear, disgust, and pity. The material has been presented to the subjects in the form of items that may call forth a certain degree of the emotion in question with the instruction that the amount of emotion caused in the individual subject be indicated by him in each case. The responses are limited to four: "very much, much, little, and none at all." Groups representing various parts and levels of the population have been drawn upon and the present findings are based on the responses of more than a thousand cases about equally divided between the sexes. (1) The most conspicuous sex difference found is in the degree of emotion felt in general. It is a feminine trait, if we may judge by this test, to express excessive emotion in all four directions, *i.e.*, the women and girls tend to be *very* angry, fearful, disgusted, and pitying, whereas the men and boys feel less emotional, or say they do, in all four moods. (2) The greatest sex difference is in disgust, the average woman, representing all groups combined, feeling more disgusted than all but 25 per cent of the men. The difference is next greatest in anger, and least in pity and fear. In fear there are many more women and girls who feel greater emotion than the average for the most emotional group of males, but there is only a small difference in degree of emotion between the least fearful groups of the two sexes. The most pitying males are as emotional as the most pitying females, but there are more groups of males who feel, or say they do, less pity than there are of females. In both sexes and for all four emotions the older, the better educated, and the more intelligent individuals show a tendency away from excess in emotional expression. The test of emotion as a whole has been found statistically reliable and it consistently brings out sex differences, especially in adolescents.

Analysis of Errors in Learning. H. C. GILHOUSEN, University of California (introduced by Warner Brown).

The general experimental question was the following: What stimuli sequences precede errors in serial reaction, and when such errors occur are they toward a favored reaction or are they random responses? A machine was devised to register partial and tentative errors as well as full errors in motor learning. The data showed that errors increased for the practice period of eight days, while the time records showed the customary decrease with practice. The first trial of each day showed least errors for the day with progressively larger error scores for the four succeeding trials. Only tentative

indications in the results have as yet been obtained on the general experimental question.

Quantitative Measurement of Sexual Excitability in the Female Rat. JOSEPHINE BALL, University of California (introduced by Warner Brown).

Description of a test that samples the readiness with which the heat behavior pattern may be elicited in the rat. Fifty-one rats were tested every three hours throughout two heat periods. Thirty of these were observed through four periods. Such records afford considerable information concerning variations in normal excitability as well as testing a test that had been worked out during a previous year of work. The rats were rated on three five-point scales on the basis of their reactions to various types of males and to the stimulation of their sides by the experimenter in crude imitation of the clasping behavior of the male. The test requires an average of two and one-half minutes, which makes it possible to use in roughly standardizing the stimulus to be used in quantitative studies of male sex behavior as well as other problems involving measurement of female excitability. The reliability coefficient for the test is $.88 \pm .02$.

Prediction of College Success at the University of Oregon. HOWARD R. TAYLOR, University of Oregon.

Records are now available for a period of four years in which the American Council of Education college entrance examination has been used and compared with total average grades, first year grades, and grades for special courses. In addition, special measures have been used to supplement these data for the field of reading, in which ability to comprehend material is related to note taking.

The Meaning of Mind to a Social Anthropologist. ROBERT REDFIELD, University of Chicago.

Anthropologists have taken the term "mind" over from common speech, as it occurs in such phrases as "the mind of the Mexican," "the mind of primitive man." In the course of anthropological use "mind" has come to describe the type of activity characteristic of one group as contrasted with another. The Mexican "mind" is not identified with a special Mexican biological structure. Such a structure may exist, but neither anatomical research nor mental testing has identified it. The inconsistency of the distributions of racial structure and function has induced the anthropologist to regard the

assumption of such a special biological structure as unnecessary. "Mind" in this sense is an aspect of culture. The real culture trait is the common significance which an object or a chain of neuromuscular activities has to the group. This becomes, in the last analysis, a psychological matter. In considering mental activity typical of groups individual differences tend to cancel out. This mental activity receives its characteristic form as a product of experience. The run of experience is determined by the culture patterns. The "mind" characteristic of any group can then be studied by reference to the culture of the group. Levy-Bruhl has suggested an extension of this view that has never been adequately elaborated or successfully controverted. The suggestion is that the form of the mind as well as its content is a product of culture. How we think and how we know, in so far as our thinking and knowing are representative of our group, are, like what we think and what we know, a product of the run of experience in our group. It would follow from this that the way in which we think changes as our culture changes. Wherever primitive man is taking over the ways of civilized man, one should be able to determine if the forms of thought are changing with the customs. This is suggested by personal experience in a Mexican Indian village. This village includes two groups, of the same race and not selected through migration. One group dwells nearer the source of contacts with the city; the other preserves older folk culture. Between them is a frontier of change. Here is indicated the possibility of a joint anthropological and psychological field investigation of a culture—and a "mind"—in transition.

Genetics of Learning Ability in Rats. ROBERT C. TRYON, National Research Fellow, University of California.

The object of the experiment is to determine the degree and mode of inheritance of the rat's maze-learning ability, measured by a seventeen-unit T-maze. The objective is to produce by selective breeding two pure lines of bright and dull rats, and to cross these eventual races in order to determine the nature of the genetic factors producing this ability. Results in the P, F_1, and F_2 generations indicate that this ability is inherited, in part at least, and are consistent with what would be expected if this trait were produced by multiple genetic factors.

The Origin and Present Operation of the Institute for Juvenile Research. HERMAN ADLER, Chicago.

CONTROL OF PSYCHOLOGY IN STATE UNIVERSITIES

BY DAVID SPENCE HILL

Psychology is increasingly touching every phase of modern life, and therefore the activities and the control of psychological departments in tax-supported institutions is becoming a question of peculiar significance, involving the quality and quantity of the work being done and the problem of the capability of those who have psychology in charge.

A dean in a state university, asked to explain why he insisted upon including within his one college all of the psychology offered in the institution which had many colleges in its organization, replied stoutly, if not naïvely:

"In order that I may control psychology."

The question of the reasons or motives for such individual control where it is practically centralized in a subordinate officer leads into many problems. These problems may be administrative, or personal, or purely academic—depending upon an executive's wisdom or ignorance, his predominant point of view, and the degree of influence he wields with powers that be.

The valid reasons why taxpayers support the courses in psychology as conducted in the various kinds of public institutions—universities, colleges, normal schools—are likely to be overlooked altogether when deans and professors engage in a more or less quiet struggle "for control." The fact is, students and professors have little discretion or power in the matter of organization and administration of courses bearing the name of psychology in the different schools and colleges of the complex and enormous state university as it now is, for they must do what they are told under the existing system.

Whether or not dominated by the personality or the political advantages of some one man, a university council, or committee, advises more or less compellingly the president and the board in deciding the support and functioning of any given department within a college, itself a unit of the university. Direction by councils or committees can be the wise consolidation of counsel, and it also may be merely a device for evading decisions or for obtaining the outward

semblance of support for one man's desires, as affecting some phase of departmental organization and policy.

The present-day control of psychological departments and courses in tax-supported universities of the United States is becoming a question of peculiar significance because ethical, academic, and financial issues are involved in the administration of such a central discipline as psychology. It will be a problem, sooner or later, with which the representative of taxpayers associations and legislative budget makers are likely to concern themselves, if the present confusion of objective, wastage of men, and the allegedly inequitable distribution of salaries and of appropriations continue under the prevailing methods of direction and organization.

Certain groups of students have voted that psychology of one kind or another is the dullest and most unprofitable of subjects. In addition to academic dissatisfaction there is also the contemporary popular curse of pseudo-psychologists and charlatans. Evidently a remunerative and gullible public is interested deeply in the various pseudo-sciences of the mind. There are being expensively advertised the so-called systems of phrenology, physiognomy, graphology, horoscopes, spiritism, endocrinology, vocational chemistry, bio-chemistry, yogoda, radiation, etc. On the other hand, within academic walls evidence is available which indicates the widespread unsatisfactory status of psychology as it is now being taught, maintained, and controlled in public institutions. It is not surprising that writers outside of the field see humor in the situation—and sometimes evince facetious malice toward their own particular psychological aversion. A man of big business remarks: "The very mention of the name, psychology, gives me nausea."

Irresponsible criticisms have little bearing upon the true status of psychology, but expressions from responsible men engaged in psychological work within our institutions are quite worthy of serious consideration. For example, Professor Knight Dunlap of Johns Hopkins University, within recent months, has called attention urgently to the embarrassed position of experimental psychology. These excerpts from his address indicate in part his strong exposition. He says in *Science:*

". . . the laboratory is the center of true psychological activities, and nothing which is not founded on the laboratory in the fullest degree possible is worthy of scientific consideration in our field.

". . . The situation in laboratory psychology is not satisfactory. It is not efficient. It is not safe. It is depressing. In the first

place, in response to the feverish demands after the war, we have trained too many psychologists, or partly trained them, and there is an excess of teaching and deficiency of research.

". . . I believe that most of the laboratory work given undergraduates is wasted. It is not intense enough to prepare them for research, and as a cultural effort is a total loss. Most of the students subjected to it come out with a scorn for psychology as a trivial subject . . .

"The young instructor . . . is forced by financial considerations to seek a summer school job. . . . If he teaches in a summer school, he labors with a group of tired-out school ma'ams, case hardened superintendents, college students of inferior grade who have flunked their courses in regular session, and an assortment of high-school sheiks and flappers. He accomplishes nothing of importance, and he comes back to his fall work fatigued and unprepared for it. . . .

"Politics is by no means absent from universities, and departments can often enforce claims to consideration against other departments."

The present writer has received from professors throughout the country many comments on the academic situation regarding psychology, and the following illustrations show that some of the professors regard the situation as crucial.

A professor of psychology in a mid-west university says:

"I could write a volume on it but deem it best to keep my ideas to myself. If the present trend keeps up, within thirty years we will not have any psychology or any educational psychology."

Another well known teacher and author, in an eastern university, also speaks:

"We have no college of education (yet, at least), thank God.

"I am strongly convinced that a single department of psychology, organized about an experimental laboratory, should be responsible for all courses in psychology (including educational psychology) given in a university. In no other way can educational psychology and social psychology keep their feet on the ground. The situation in regard to educational psychology in teachers colleges today is appalling.

"I do not mean that the same man is competent to give all courses in psychology. There should be a properly specialized staff, but the staff should be unified by departmental organization and should engage together in a weekly departmental seminar."

Opposed to this viewpoint is that of a dean of education in a state university north of the Ohio, who writes rather vehemently:

"All psychological work on our campus is centered in one, and in only one department (the College of Education)."

In answer to our question whether there were more than one department of psychology in his institution, he also replied:

"One, thank heavens."

The dean of the School of Education of a southern state university wrote to us that in his institution psychology as given in the College of Arts and Sciences is considered to be the center or foundation of all work in psychology for the various other colleges. But he says:

"Educational psychology is rated as *education*, hence is not dominated by what might be called 'pure psychology.' Our School of Education, due to its local evolution, includes sociology, philosophy, psychology, education. The dean controls the types of courses offered, and in this preserves unity with much independence. Our professor of experimental psychology has a narrow view of social sciences and of educational psychology. The old type psychology was foreign to education . . . much of the present-day psychology is about as foreign as the old, and almost as philosophical or theoretical. . . . There is an individualistic type of experimental psychology that hands out very little of value to a school of education. If the central division of psychology can be directed by a head who is also an educational psychologist there may be unity and harmony. Leland Stanford, Jr., University is a partial example. . . . General psychology is yet unstable, divided into warring camps fighting over theories and has far to go in order to put its house in order."

It appears clearly enough from these samplings of contemporary opinions from responsible persons intimately concerned, that serious disagreement exists concerning (1) the quality of general psychology being given, whether for culturistic or for practical purposes, and whether such instruction be given by professors of "pure" or of "educational" psychology; and with reference to (2) the centralized or unified control of all courses in psychology, whether such control inheres in the College of Arts and Sciences or in the College or School of Education.

In order to ascertain the prevailing modes of control and of centralization of courses in psychology, the writer sent in March an inquiry to heads of departments of psychology, and to the deans of education, and to certain other persons when advisable, in all of the

state universities and to most of the greater endowed institutions of the country. The responses were prompt and liberal and the data obtained are interesting in showing the present status of internal control of psychology within our universities.

The facts are set forth in compact form in the following paragraphs (a, b, c). Many of the answers to our questionnaire were qualified by explanations indicating that some correspondents are chary about stating the degree of independence or of autonomy of their departments, or else are uncertain about the articulation and unification of various courses in some manner using the word "psychology" on their own campuses. The difficulty is increased by the fact that in certain institutions educational psychology is cataloged as "education," and therefore it is practically independent of the departments of psychology.

(a) First: In nearly all of the institutions responding psychology is centered in the College of Arts and Sciences, or of Liberal Arts, namely:

Tax-Supported Universities—Arizona, Cincinnati, Colorado, Cornell, Delaware, Florida, Georgia, Hawaii, Indiana, Iowa, Kentucky, Louisiana, Maine, Mississippi, Montana, Nevada, New Hampshire, New Mexico, North Carolina, Oregon, Pennsylvania, Pittsburgh, South Carolina, South Dakota, Tennessee, Texas, West Virginia, Wisconsin, Wyoming.

Endowed Institutions—Columbia, Duke, Emory, George Washington, Hopkins, Northwestern, Princeton, Stanford, Yale, Washington.

(b) Second: In these four universities psychology seems to be centered in the College or School of Education, namely:

Alabama, Idaho, Ohio, Purdue.

(c) Third: In these seventeen universities, while in some instances all psychological work has its center, or foundation, in the College of Arts and Sciences, nevertheless there are two or more nearly autonomous departments in the other colleges of each university, namely:

California, Cincinnati, Cornell, Illinois, Kansas, Kentucky, Michigan, Minnesota, Tennessee, Texas, West Virginia.

Of the endowed institutions in this list are Chicago, Columbia, Harvard, Yale, Washington.

Some of the responses could not be expressed adequately in tabular form—and this applies especially to the letters received from the greater endowed institutions such as Harvard, Columbia, Cornell, and the University of Chicago.

In all four of these institutions psychology has developed in several different directions and almost autonomously, notwithstanding the fact that there is in each institution a department of pure psychology with varying relations, or attachments, to the applications of psychology to business, or to medicine, or to divinity, or to agriculture, or to education. It is the special purpose of this paper to present the problem of control as between the College of Arts and Sciences and the College or School of Education, in tax-supported institutions, and therefore we cannot digress to discuss further the similar problems of the endowed institutions. We have omitted altogether from this study a discussion of the status of psychology in normal schools and teachers colleges.

Without attempting to give a final solution of the problems involved in the existing status of university psychology, we may offer these five generalizations:

1. It is plain from the assembled facts that the overwhelming number of state universities have one main department of psychology, and that the psychological work done in Arts and Sciences is usually regarded as the center and foundation of all other psychological work done in a university. An excellent illustration of this sound type of organization is the plan of the University of Iowa.

2. Whether a fundamental course in general psychology should be required either as prerequisite or parallel to any course in the applied field—as in education, or commerce, or medicine, is an important question. It is our own opinion that much of the present near-chaos as between psychology and education arises from the neglect of this requirement.

3. It is also apparent that the general problems of control of the psychological courses and of the appointment of teachers and of researchers in psychology, in at least the minority of tax-supported institutions, are far from settlement.

On the one hand there are pedagogists accused of ignorance of the biological, philosophical, and experimental foundations of psychology. On the other hand there are the pure psychologists submerged in laboratory technique or in near-metaphysics, or perhaps interested in introspectionism, or in behaviorism. Many psychologists unfortunately affect an open contempt for education in its various branches. There also are the theologians teaching psychology. The doctors complicate the situation by entering psychiatry without having adequate psychological background or training.

4. It is a serious question whether the approximately one thousand doctors of philosophy graduated in education and in educational

psychology during the past ten years have received preliminary training in such fundamentals as neurology, philosophy, and the elements of anthropology—fundamentals at least as important as a knowledge of statistics, or of tests and measures, or of the history of education, or of the technique of teaching, or of summaries of laws and of finance *et cetera*, are—for the thorough understanding of education, not to speak of psychology in manifold aspects which hundreds of specialists in education now undertake to teach.

One scarcely would have the temerity to inquire, but it would be enlightening to ascertain exactly to what extent the living teachers of psychology and the teachers of education have in their own training received first hand knowledge of the historical developers of psychology, both pioneer and also contemporary. We would include in the minimal list of developers: Socrates, Aristotle, Wolff, Herbart, Wundt, Helmholtz, Mach, Külpe, Ebbinghaus, Hoeffding, Kraepelin, Forel, Claparede, Bechterew, Ribot, Binet, Janet, Jung, Freud, Bernheim, Moll, Myers, Sully, Sanford, Hall, Burnham, James, Cattell, Titchener, Seashore, Stratton, Swift, Ladd, Witmer, Judd, Watson, Bott, Pillsbury, Thorndike, Woodworth, Washburn, Yerkes, Terman, Fernberger, Dunlap, and Gesell.

Scientific, as opposed to pseudo-scientific, psychology has proven as well as potential values in its cautious applications to education, to business, to medicine, to law, and for the home. Whatever may be either the excellencies or the imperfections of different systems of control of psychological departments which exist supposedly for the attainment of these values in our universities, it is evident that the scientific integrity of the work, under whatever organization it may be given, depends for success in last analysis upon the adequate qualifications and the broad point of view of the individual instructors.

5. The man in control of the executive functions of the modern university—the president—it would seem, now has a task added to his already overwhelming program. It is up to him to act courageously as arbiter and judge of psychologies and of psychologists, of educationists and of politicians.

Wherever professors and administrators are indifferent to the present-day interest in psychology, or are largely ignorant of the wide scope and of the scientific methods of the field, or have no other dominating objectives beyond the attainment of power or personal aggrandizement, the prevailing waste of man-power and of money, and the confusion, will likely continue, particularly in state universities.

A NOTE ON KOHLSCHÜTTER'S CURVE OF THE "DEPTH OF SLEEP"

BY T. H. SWAN

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Since the publication of Kohlschütter's experiments (3) on the so-called "depth of sleep," they have been almost universally regarded as classical. Although the work has been criticized (4, 5), the results have been fully accepted and the curve reproduced in many books and special articles on sleep. In spite of this widespread acceptance of Kohlschütter's report, a critical study readily discloses numerous large discrepancies between the data reported and the curve supposedly founded upon it. This variance seems to have escaped the notice of earlier reviewers since the writer has not yet been able to find any mention of it in the literature.

The curve was advanced by Kohlschütter as an "ideal" representation of "the deepening and enshallowment of sleep in its dependence on its duration" as derived from a series of observations made on one individual during the course of eight experimental nights. The observations made actually consisted in measuring the arc through which a pendular hammer fell to strike against a slate slab and the distance from this sound-producing apparatus to the subject's nearer ear at the time of each experiment. The observations were made at irregular intervals during each night. The relative sound intensity in each case was then assumed to be measured from the height of fall of the hammer multiplied by its mass and divided by the square of the distance from the nearer ear and reduced to a standard distance of one Leipzig foot (31.3 cm.).

The resultant relative intensities are presented in two tables (pp. 225, 226), according as the left or right ear was nearer the sound-producing instrument at the time of stimulation. Upper and lower limiting values are recorded for each observational period: the lower limit being the greatest intensity at which awakening failed to occur; the upper, the lowest at which the predetermined response was given by the subject. A third table (p. 228) presents *weighted* mean values derived from the upper and lower limits of the calculated intensities reported in the previous tables. It is from these weighted mean values that the curve was said to have been constructed.

The values entered in columns (a), (b), (c), and (d) of Table I are means of the relative intensities for each time period whose manner of procurement is described later. The figures to be found in columns (e) to (h), inclusive, deal with the number of experimental observations belonging to the various time intervals. Their significance is likewise pointed out later on in this article.

As noted in the table, one datum was disregarded at each of the one-hour and one-and-a-half-hour periods in columns (b) and (c) in obtaining the averages given there. In Kohlschütter's table (p. 228), one observation at each of these periods is assigned a value represented by the infinity sign which is later explained (pp. 227, 245) as meaning that the subject was not awakened by the greatest stimulus the experimental apparatus was capable of producing. In a later series of experiments the value corresponding to this maximal stimulus is said to be 0.2722. Even when this value is properly substituted and the resultant mean included with the others in each instance, no greater accord is obtained with the corresponding value from Kohlschütter's curve. Consequently the one datum was discarded in each case.

Column (a) of Table I presents the values for each time period as obtained by direct reading from Kohlschütter's curve. In column (b) are to be found those obtained as arithmetric averages of the data (with the exception just mentioned above) presented as the basis of the curve. Inspection shows most of the values for the respective time intervals not to be in good agreement.

In his consideration of the data that he had compiled, Kohlschütter seems to have tacitly accepted as a fundamental concept, that the course of sleep, most particularly during its latter parts, must occur in a regular and fixed manner. Consequently, after the first two hours, he regarded (p. 231 ff.) any value greater than the preceding and following ones, regardless of the time interval between, as irregular and due to interfering causes. From his experimental journal he found reason to question some twenty-three of his observations (more than 30 per cent of his total data). Column (f) shows the distribution of these questioned values and (c) the averages after the latter have been eliminated. These figures are in somewhat better agreement with those of column (a), but still are not satisfactorily so.

An attempt was made to see if an appropriate selection of the data in Kohlschütter's table would yield averages which were in concordance with his curve. Such is possible, as is shown by the agreement of columns (a) and (d). In column (h) are to be found the number and distribution of the data discarded to obtain this agree-

TABLE I

Duration of Sleep in Hours	Values as Calculated: From Kohlschütter's Curve of "Depth of Sleep" (a)[w]	Values as Calculated: Values in the Table on p. 228 (b)[w]	Values as Calculated: As a Means of Unquestioned Values (c)[w]	Values as Calculated: Selected Values (d)[w]	Observations: Total Number (e)	Observations: Questioned (f)	Observations: But Used in Locating the Curve (g)	Observations: Discarded to Obtain Values in (d) (h)
0.50	613	612	612	612	2	0	0	0
1.00	781	589[x]	193[x]	784	4	1	1	2
1.50	210	143[x]	134[x]	206	6	2	1	3
2.00	107	124	95	110	6	2	2	1
2.50	36	30	30	37	5	0	0	1
3.00	27	79	106	27	8	3	2	4
3.50	18	13	13	18	3	0	0	1
3.75	15	28	..[y]	..[y]	1	1	0	1
4.00	12	148	4	11	6	3	1	4
4.33	8	17	18	..[z]	2	1	0	2
4.50	5	26	4	4	3	2	0	2
5.00	4	51	5	5	6	2	0	2
5.33	3	45	45	3	2	0	0	1
5.50	3	88	3	3	3	2	0	2
5.75	3	19	19	..[y]	1	0	0	1
6.00	2	28	4	4	4	1	0	1
6.16	2	217	2	2	2	1	0	1
6.25	2	3	3	3	1	0	0	0
6.50	2	15	15	2	2	0	0	1
7.00	1	78	1	1	3	1	0	1
7.50	1	8	0.3	0.3	2	1	0	1
8.00	0	2	2	0	2	0	0	1
				Totals	74	23	7	33

[w] These figures are to be multiplied by 10^{-4}. They are reduced to the form given here for ease in comparison.
[y] Only one observation made at this period.
[x] One value disregarded in obtaining these averages.
[z] Impossible to get any agreement between observed data and the corresponding value in (a).

ment. It was necessary, however, to use approximately a third of the values which Kohlschütter had specifically questioned, as column (g) reveals. Column (e) sets forth the distribution and number of the experimental data. Comparison of the various columns indicates that such a smooth curve as was presented can only be obtained by the rejection of 45 per cent of the total data and the use of another 10 per cent which seemed questionable to the experimenter.

Over 80 per cent of the rejected data belongs to that portion of the sleeping period occurring after two hours had elapsed. Its rejection has the effect of allowing the greater part of the "depth of sleep" curve to become smooth and regular. The possibility of the course of sleep being of an oscillatory nature is considered by Kohlschütter (pp. 237–238), but abandoned in favor of chance influences because he failed to discover any regularity in the fluctuations. If, however, a curve is constructed from the values found in (b) and disregarding the question of the comparability of what is measured in each instance, the curve is found to have a form roughly similar to some of the curves obtained by Michelson (4) with acoustic stimuli, De Sanctis and Neyroz (1) with tactile stimuli, and Johnson and Weigand (2) in sleep-activity measurements.

As evidenced in other portions of Kohlschütter's article as well, there is an apparent lack of proofreading in the table appearing on page 228. This table is derived from those on pages 225–226. A comparison of the three renders it quite evident that the figures as given in column VIII for the left ear and column I for the right ear are displaced one time-period downward from the one to which they really belong. Similarly, the value given for the 5.75-hour period in column V for the left ear in reality occurred at the 6.00-hour period. These data were returned to their proper places in the construction of Table I given above.

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THE INFLUENCE OF LETTER POSITION ON RANGE OF VISUAL APPREHENSION—A REPLY TO DR. CROSLAND

BY MILES A. TINKER
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In a recent note[1] Dr. Crosland questions my interpretation of certain results in his and Miss Johnson's study of visual apprehension. My comments concerning Crosland and Johnson's experiment are to be found on pages 227–228 of my review.[2] All that was said there about their study is given in the following quotation: "In a recent study Crosland and Johnson report results which indicate that, in series of letters, the position at the left end is the most favorable position in the series for correct apprehension, and that each succeeding position toward the right is less favorable than the location at its left. Letter series of various lengths were used. This undoubtedly favored the above findings, for responses are more uniformly correct with the shorter series in visual apprehension work. This, of course, would tend to give more correct responses to the positions at the left when all results are considered together." It should be noted that I stated that this condition "favored the above findings," and not that it was the determining factor. Furthermore, I neither stated nor implied that, in their results, the curve of the diminishing effectiveness of letter positions from left to right should "correspond with the curve of the numbers of letters or with the curve of the possible (maximum) scores."

As to Dr. Crosland's points on pages 375–376:

1. I had assumed that all groups of letters in their study were printed each in the center of its card. This is the customary procedure in experiments on visual apprehension.

2. Fixating the center of the exposure field is also routine procedure in such experiments.

3. The fact that positions 1, 2, and 3 on the various cards came

[1] H. R. Crosland, The Influence of Letter Position on Range of Apprehension—A reply to Dr. Tinker. Psychol. Bull., 1929, **26**, 375–377.

[2] M. A. Tinker, Visual Apprehension and Perception in Reading. Psychol. Bull., 1929, **26**, 223–240.

at various places with respect to the center for the various series would not prevent the apprehending of a large percentage of the short series correctly. This has been noted by workers in the field of visual apprehension.

4. Presenting the series of letters (3's, 4's, etc.) in random order does not prevent habits of reading or preferences for reading from left to right in all series, small and large. My own experience with visual apprehension work shows this to be true. When an entire series of tachistoscopically exposed letters is in the field of clear vision there is a general tendency with practically all observers to read from left to right.

5. Examination of the graph presented by Crosland on page 377 reveals exactly what I would expect. No part of my statement implies that there should be a correspondence between the curve of possible scores and the curve of obtained scores. Data[3] collected under conditions comparable to those in Crosland and Johnson's experiment demonstrated that responses are more uniformly correct with shorter series of letters. When the score is per cent of times a series of a given length is read correctly, the averages of four subjects for letter series of 3 to 12 items in length were: 3-letter series, 79 per cent; 4, 64; 5, 28; 6, 2; 7, 1; 8, 0; 9, 0; 10, 0; 11, 0; 12, 0. Here, for series of 3, 4, and 5 letters, a rather large percentage of the series were read correctly. And the percentage of correct readings decreases with the increase in length of letter series. It is inevitable that this condition should effect the frequency of correctly read letters in several positions in the series when series of all lengths are considered together. Hence the comparable situation in Crosland and Johnson's experiment *undoubtedly favored* the accumulation of high frequencies in the first four or five positions in their letter series.

I readily admit that it is very likely that Crosland and Johnson's "subjects possessed habits of reading from left to right in exposure periods of 150 σ," and that such habits probably were a very important factor in producing the results described. To obtain an accurate picture, however, of the relative influence of letter position on range of visual apprehension, letter series uniform in length and longer than the average subject's range should be employed. If these conditions had been fulfilled I am convinced that Crosland and

[3] M. A. TINKER, How Formulae Are Read. *Amer. J. Psychol.*, 1928, **40**, 476–483.

Johnson would have found trends similar to those they describe but that the frequencies in the positions at the left would be somewhat smaller. The general trends found by Crosland and Johnson were accepted as valid in my review (see quotation at the beginning of this article). Dr. Crosland's arguments are seemingly based on a misinterpretation of the word "favored" used in that review.

SPECIAL REVIEWS

MEAD, MARGARET. *Coming of Age in Samoa.* A Psychological Study of Primitive Youth for Western Civilization. Illustrated. (Foreword by Franz Boas.) N. Y.: Morrow, 1928. Pp. xv + 297.

Miss Mead has written an excellent challenge to the frequently accepted belief that the common disturbances of adolescence are physiological in nature and consequently largely unavoidable. "Here are the proper conditions for an experiment: the developing girl is a constant factor in America and in Samoa; the civilization of America and the civilization of Samoa are different. In the course of development, the process of growth by which the girl baby becomes a grown woman, are the sudden and conspicuous bodily changes which take place at puberty accompanied by a development which is spasmodic, emotionally charged, and accompanied by an awakened religious sense, a flowering idealism, a great desire for assertion of self against authority—or not? Is adolescence a period of mental and emotional distress for the growing girl as inevitably as teething is a period of misery for the small baby? Can we think of adolescence as a time in the life history of every child which carries with it symptoms of conflict and stress as surely as it implies a change in the girl's body?

"Following the Samoan girls through every aspect of their lives we have to answer this question, and we found throughout that we had to answer it in the negative" (p. 196).

In reaching this conclusion Miss Mead spent nine months in Samoa studying primarily a group of sixty-eight girls between the ages of about eight and twenty years in three neighboring villages on the island of Tau. Each of these girls was considered as an individual case and every attempt was made to record all of the significant factors in their lives. The almost complete absence of adolescent conflicts which was demonstrated by the analysis of this material can apparently best be explained by the simple Samoan culture, a culture which presents few situations of difficult choice to the growing child, which allows the growing girl (or boy) to slip easily and without mental disturbance into her adult attitude toward

and participation in work, play, sex, religion, family life, government, social class and other duties or interests.

It is worth noting that the Samoan culture is favorable for the normal maturation of the child in no small measure because it is not a pure primitive culture but rather a mixture of the native with the Western civilization. The old order was "less flexible and dealt less kindly with the individual aberrant." In the new order severe penalties and situations, formerly fertile sources of conflict, have been removed or minimized in their influence with the result that the Samoan adolescent is, from the mental hygiene point of view at least, one of the most fortunate on earth. It might not be easy to locate another such paradise of mental health.

It would not be a simple task to bring about such a paradise in the United States. As Miss Mead points out, the mere knowledge of the cultural nature of adolescent disturbances is not sufficient for their elimination. Her contrast of the growing child in Samoa and in America is startling; it suggests in a broad way the ultimate remedy for the frequent conflicts in our children's lives. Possibly Miss Mead exaggerates the extent and significance of adolescent disturbances in the United States, for that part of the study which deals with our own children certainly does not appear to be the result of the same anthropological method of study and analysis of unselected children as was made in Samoa. Nevertheless, the contrast is so sharply drawn that it cannot be brushed aside as due to the author's over-emphasis on American adolescent problems, under-emphasis of Samoan developmental conflicts or desire for popular sale.

Everyone interested in the growing child or in the efficiency of Western civilization should consider seriously the way the Samoan girl comes of age. The reviewer, however, refuses to assume responsibility for any new mental conflicts which may be precipitated by the exposure of our standardized school teachers and middle class parents to Miss Mead's facts and interpretations.

DONALD YOUNG.

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DREVER, JAMES, and COLLINS, MARY. *Performance Tests of Intelligence.* Edinburgh: Oliver and Boyd, 1928. Pp. 52.

The sub-title of this book, "A series of Non-Linguistic Tests for Deaf and Normal Children," explains fully its purpose. The main contribution is a scale of eight performance tests, with direc-

tions for giving and scoring. Most of the tests in this scale are already well known and have been taken over with few or no modifications. One new test is included, namely the Domino Test.

Tentative norms for hearing and deaf children are given. These are based upon only two hundred cases for each type of child. The interesting thing is, however, that there is practically no difference between deaf and hearing children. The authors say, "When the language factor is entirely eliminated from our tests, it is very doubtful whether the deaf child is retarded at all. At any rate, it appears certain that the deaf child is much less retarded than has been generally supposed." This conclusion contradicts many studies made in the United States with all kinds of intelligence tests, in which the deaf have always been very much below the hearing. The reviewer himself has tested many hundreds of deaf children with all types of tests and has always found them below the hearing norms. He wonders, therefore, whether the deaf children tested by the authors were not highly selected for intelligence in some way or other. It is to be hoped that the authors will continue their work and present their results in a more detailed manner in the near future.

R. PINTNER.

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HULL, C. L. *Aptitude Testing.* Yonkers, N. Y.: World Book Co. 1928. Pp. xvi + 535.

With the accumulation of data from tests in various spheres of human activity it has become more and more apparent that reliable individual guidance demands much beyond what available tests offer. Improvement will come through better methods of applying present instruments of measurement and through a continuous analysis of data which will result in a clearer understanding of the basic qualities to be measured.

Dr. Hull has something to say on both aspects. His purpose as set forth in his preface is to give:

"(1) an account of the fundamental principles of aptitude testing and (2) an intelligible description of the most effective and most economical methods of constructing batteries of aptitude tests."

His general point of view is represented by the following paragraphs (p. 19):

"It has been and still is the custom to a very large extent, even among trained psychologists, to call nearly all psychological tests, tests of intelligence. . . . There is no exact agreement as to what

this unknown something called 'intelligence' is, though it seems to be thought of in the main as a kind of super faculty. There are indications, however, that this idea of the function of psychological tests is falling into disrepute.

"The recognition that if a test is to be of any particular value it must enable us to forecast a *particular* aptitude or group of aptitudes rather than measure some hypothetical or semi-metaphysical faculty, constitutes a great advance. During the period now happily drawing to a close, psychologists dominated by an essentially metaphysical notion of intelligence and consequently having no definite concrete criterion against which to test the validity of their tests, frequently moved in a circle in their scientific efforts. With the abandonment of this paralyzing idea of measuring *general* intelligence as a goal of testing activity, there is now appearing a vigorous and healthy concentration upon the development of tests for the greatest variety of concrete aptitudes."

The expectations of the reader after such a vigorous opening unfortunately are not fulfilled. The author gives a summary of theories of the basic constitution of aptitudes and illustrates how a theory of group aptitude determiners *might* explain certain illustrative situations, but he does not give any evidence as to what some of the basic aptitude determiners really are or how they are related to one another and to various concrete activities like success in school or ability to succeed as a stenographer. We still lack a "definite concrete criterion." The material does, however, furnish excellent illustrative material for giving meaning to different problems arising around correlation technique.

The author also promises to show that (p. 37):

"Despite the fact that trait differences have received scant attention in works on differential psychology, they are for the masses of mankind of far greater significance than individual differences."

The results for the present reader were not conclusive. Mere case studies of selected examples purporting to show wide differences in subjectively labelled "traits" is certainly not characteristic of the spirit of the rest of the book. Nor does the analysis of the results of 107 students in 35 standard psychological tests to give a distribution of high in the middle and tapering out at each end warrant such a significant statement as (p. 46):

"The indication is clear that the distribution of talent within an individual follows the normal law much as do the distributions of individual differences."

With a few such cautions the book is heartily recommended as a real help to students in the field of testing. It deserves the highest recommendation for its full use of illustrative material and its interesting style. The author has not been afraid to use enough space to make his illustrations clear and one does not need several commentaries on the main text in order to understand what the author is trying to say. This will be especially valuable to students who have to work independently.

Chapter IV gives an excellent summary of the present status of anatomical and other alleged signs of aptitudes. The helpful explanatory material on correlations has already been noted. The second part of the book gives a detailed guide for the procedure in specific situations as far as that is possible without knowing the particular aptitude to be tested. The description of work sheets and methods of procedure for computing correlation coefficients with checks for accuracy will be appreciated, and should be read by all who compute correlations seriously. Anyone who has had any extensive experience with the computation of correlations realizes how important it is to stress the constant and repeated checking for accuracy and yet too many books simply assume that students will do this automatically.

It would have been a real service if the author could have given a summary of non-scholastic tests with such information as source, price, reliability, validity, etc., in addition to the illustrations about tests which he presents. Such information is badly needed. In view of the importance of rating scales in the present testing situation, regardless of what may be their future status, the author might have given somewhat more space to the problem of constructing really useful rating scales.

In summary, Aptitude Testing will be found a very helpful book for anyone who is facing the problem of actually putting together a battery of tests for predictive purposes. Because of its style and use of illustrative material it is a valuable addition to the books available for classroom use.

RALPH B. SPENCE.

Teachers College, Columbia University

CHASSELL, *J. O. The Experience Variables.* Rochester, N. Y.: 1928. Pp. 22.

"A Study of the Variable Factors in Experience Contributing to the Formation of Personality." The author has presented in

private print "The Experience Variables Record," with an "Explanation of the Record Inventory and Scale, a study of the Reliability of the data, a discussion of Psychogenic factors associated with certain Personality Traits, and a detailed analysis of Associations giving a Q of .50 or above.

Under 12 titles 194 items are possible of investigation, as follows: Mother Relationship 20, Father Relationship 19, Relationships with Brothers and Sisters 11, Home Life 22, Religion and Standards 20, Sex Development 25, Love Affairs 19, Physical Development 9, Intellectual Development 6, Vocational Adjustment 16, Social 19, and General Emotional Adjustment—Happiness 8. A scatter of four comparative phrases are noted under each item.

The Record is divided into four columns, making a possible rating of each item over the following backgrounds: I, Environmental situation; general background. II, Environmental factors bearing more directly upon the individual subject. III, Subject's Responses; his traits, interests, tendencies. IV, Problems of Adjustment and main "Difficult Situations" encountered by later adolescents. The preceding column or columns are expected to assist in the explanation of the ensuing column response.

The study is based upon the "brilliant insights and highly useful theories" of psychoanalysis, and chooses as an objective approach "the study of the remembered experiences of representative sampling of adults." Uses suggested include statistical tabulation, as a questionnaire or basis for same, an adjunct "to personal counseling with college students," and as a syllabus for group discussions in mental hygiene or sociopsychology.

The reliability findings are based upon "individual items" rather than a total test score. Average correlations of .70 are therefore accepted as a "fair index." The recency of revived memory may be largely responsible for much of this correlation.

A very extensive "Record" contains many stimulating suggestions. It is open to innumerable methods of approach and may be modified easily to comply with various methods of securing information. Statistical treatment may be made to meet any method used.

R. A. BROTEMARKLE.

University of Pennsylvania

FRANK K. SHUTTLEWORTH. *The Measurement of the Character and Environmental Factors Involved in Scholastic Success.* Univ. of Iowa Studies in Character. 1927, 1, No. 2.

Analyzing the methods of attacking the maladjustments of scholastic success, the author has chosen as his problem the "supplying additional, specialized, and effective tools, which will aid the personnel department and the administration in more adequately adjusting students to the process of higher education." The test battery developed contains an assayer, a self-rating device, and a questionnaire. The reliability measures are secured for the various items involved in each, and the author concludes statistically "while none of the original or revised predictions is very high, all are substantial and compare not unfavorably with predictions from the best mental-educational tests available." "The interpretation of the factors measured and associated with success or failure is more difficult and involved." The interpretations made, while interesting, are rather questionable. The revised editions of the test forms are presented.

If the experience of numerous personnel officers is true, that one of the greatest values obtained from test materials is the opportunity to reveal to the individual student, in an objective form, his deficiency in coping with certain situations, it is necessary that materials developed shall be of a most convincing nature. While the materials presented are of great value for the general interview of the student, it is somewhat questionable how convincing they may be since there is so great a range of possible interpretation.

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MORGAN, J. J. B. *The Psychology of Abnormal People: With Educational Applications.* N. Y.: Longmans, Green, 1928. Pp. ix+627.

To the voluminous literature of abnormal psychology Professor Morgan has added another title, a book which, as the subtitle suggests, is on the text-book level. It is based on his own undergraduate course, supplemented with suitable parts of the literature and with cases from his own clinical experience. This volume, designed primarily for the teacher and the college student, will be valuable, the author believes, to the physician, pastor, social worker, judge, lawyer, police, executive, politician, etc.

To attempt, in one volume, to present criteria of normality, to outline the scientific method of approach, to cover certain facts of normal psychology, and then to discuss all the various phases of

abnormal psychology, including numerous clinical tests, therapeutic measures, and educational approaches, has resulted in a degree of superficiality, a fact explainable, however, in terms of the author's purpose. There seems unfortunately, to the reviewer, to be a lack of proportion in the treatment of the various subjects; for example, while almost fifteen pages are devoted to the methods of inducing hypnosis, a chapter on mental hygiene covers but twenty-four.

The author might well have entitled his book, The Psychology of Abnormal Personality, because for him each of the abnormal phases of which he treats, be it a perceptual disorder, memory abnormality, dream, delusion, etc., is merely a reflexion of the personality of the subject. He is interested in the development of a normal personality, of a normal adjustment to the environment. To him, integration, a unification of the individual "in spite of the diversity of original equipment and experiences which he meets," expresses the keynote of personality. Whether the force behind this integrative process is instinct, libido, autonomic tensions, or something still different is of minor import to abnormal psychology.

We agree with Professor Morgan in his emphasis upon the educational process as a most important element in the proper development of personality, but at the same time feel, as many others are sure to do, that much more emphasis must be placed on organic and metabolic changes as the basis of personality disturbances. Not all psychiatrists or psychopathologists regard the "complex" or "wish" as the basis for the majority of the so-called functional disorders.

The author leans toward the psychoanalytic school in the interpretation and diagnosis of the particular departures discussed. But one should not expect to find here a strict adherent of Freud, Adler or Jung, as Professor Morgan has accepted only those mechanisms and explanations which seem to have a real logical basis. Considerable space is devoted to the different methods of analysis and their interpretation.

The chapter headings follow the usual conservative order: Disorders of Sensation, Disorders of Perception, Disorders of Association, Delusions, Abnormalities of Memory, Emotional Disorders, Motor Disorders, Abnormalities of Intelligence, Personality, Sleep and Dreams, Suggestion and Hypnosis, Hysteria, Disorders of Regression, Compensatory Disorders, Episodic Disorders, Mental Hygiene. A brief outline precedes each chapter which, in turn, is summarized at the end; a list of the important technical words with their meanings, and projects for further study complete each chapter.

Whether or not one agrees with Professor Morgan's interpreta-

tions of abnormal phases of behavior, one cannot fail to appreciate the important function of early training by both parents and teachers in the proper development of a normal emotional life, of a fully adjusted personality. To impress this on the student, the teacher, and the casual reader has evidently been the author's aim.

University of Pennsylvania SIDNEY SANDERSON.

FLORENCE E. GOODENOUGH. *The Kuhlman-Binet Tests for Children of Pre-School Age.* Minneapolis: Univ. of Minn. Press, 1928. 146 pages.

The preface to this small volume describes the work reported in it as "a model investigation in the field of intelligence-test evaluation, both with regard to the techniques employed and the results obtained." It gives distinct pleasure to find in this case, unlike many others, that the promise of the preface is fulfilled in the main body of the report.

The author makes use of 495 children of pre-school age (of which 300 two-, three- and four-year-old children constitute a main experimental group) to secure further data on the reliability of the Kuhlman-Binet tests for children of pre-school age, and to make an experimental investigation into certain theoretical reasons for their unreliability. An unusually careful selection of cases to secure a representative sampling of the child population of the city in which the study was made, the use of a short interval between the original test and retesting, control of experimental conditions, and a skillful and complete analysis of results lead to findings and conclusions of significance not only with reference to the application of these tests, but in the consideration of fundamental problems of mental testing in general. Typical of these are findings on the reliability of the scale as a whole, and, possibly of even greater interest, on differences in the reliability of the separate tests in the scale. Of additional interest is the discovery of a relationship between parental occupations and the intelligence levels of younger children similar to that found in the study of older children. Suggestive findings on fluctuations in mental growth; on the effect of nursery training upon the development of intelligence; on the influence upon mental test results of such factors as shyness, negativism, etc., contribute further significance to a study which deserves careful reading by all interested in mental testing—at any age level—for any purpose.

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FLOYD W. REEVES and JOHN D. RUSSELL, Some Aspects of Current Efforts to Improve College Instruction. *Bull. Bur. School Service,* Univ. of Kentucky, Vol. 1, No. 2, 1928. Pp. 95.

ERNEST P. SIMMONS and HAROLD H. BIXLER, *The Standard High School Spelling Scale.* Atlanta: Smith, Hammond, 1928. Pp. 64.

ALBERT B. CRAWFORD, *Incentives to Study.* New Haven: Yale Univ., 1929. Pp. 194.

NOTES AND NEWS

THE Sixth International Conference of Psychotechnic was held in Barcelona, Spain, on September 25–29, 1929.

AN appointment service has been established by the American Association of University Professors. This service is only for members of the Association including those of Junior grade. Information may be obtained from the office of the Association, 26 Jackson Place, Washington, D. C.

AT a meeting of the Ohio College Association held at Columbus, April 4, 1929, the Section of Philosophy and Psychology was divided and a Section of Psychology formed devoted primarily to securing and maintaining high standards of personnel, equipment and teaching in psychology. Thirteen departments of Psychology were represented at the meeting. Professor M. L. Reymert of Wittenberg was elected President; Professor Horace B. English of Antioch was elected Secretary-Treasurer, and Professor F. C. Dockery of Ohio Wesleyan, Advisor.

DR. GUSTAV KAFKA, professor of psychology in the University of Dresden, has accepted the invitation to become visiting professor of psychology at the Johns Hopkins University for the winter semester of 1929–1930.

DR. W. V. BINGHAM, of the Personnel Research Federation, and Professor M. S. Viteles, of the University of Pennsylvania, have been elected honorary correspondents of the British National Institute of Industrial Psychology.

DR. ERNEST M. LIGON has been appointed assistant professor of psychology at Union College.

DR. MARTIN L. REYMERT of Wittenberg College was elected Vice-President of the Section of Psychology of the Ohio Academy of Science.